

We claim:

1. 1. A microfluidic method comprising:
 2. delivering first and second fluids to a lumen of a microfluidic device such
 3. that the first and second fluids flow adjacent to each other within the lumen
 4. without mixing except for diffusion at an interface between the first and second
 5. fluids, wherein the first fluid is different than the second fluid.
1. 2. A microfluidic method according to claim 1 wherein the composition of at
2. least one of the first and second fluids varies over time as it is delivered to the
3. lumen so that the fluid forms a gradient with regard to a concentration of at least
4. one component of the fluid that changes along a length of the lumen.
1. 3. A microfluidic method according to claim 1 wherein the microfluidic
2. device comprises a plurality of lumens, the method comprising delivering first and
3. second fluids to each of the plurality of lumens.
1. 4. A microfluidic method according to claim 1 wherein the same first and
2. second fluids are delivered to each of the plurality of lumens.
1. 5. A microfluidic method according to claim 1 wherein different first and
2. second fluids are delivered to the different lumens of the plurality of lumens.
1. 6. A microfluidic method according to claim 1 wherein the lumen has a cross
2. sectional diameter of less than 2.5 mm.
1. 7. A microfluidic method according to claim 1 wherein the lumen has a cross
2. sectional diameter of less than 1 mm.
1. 8. A microfluidic method according to claim 1 wherein the lumen has a cross
2. sectional diameter of less than 500 microns.
1. 9. A microfluidic method according to claim 1 wherein the first and second
2. fluids combine to form different crystallization conditions for crystallizing a
3. molecule.

1 10. A microfluidic method according to claim 1 wherein the first and second
2 fluids combine to form different crystallization conditions for crystallizing a
3 protein.

1 11. A microfluidic method according to claim 1 wherein the first and second
2 fluids combine to form different crystallization conditions for crystallizing a
3 macromolecule with a molecular weight of at least 500 Daltons.

1 12. A microfluidic method according to claim 1 wherein the first and second
2 fluids combine to form different crystallization conditions for crystallizing a
3 member selected from the group consisting of viruses, proteins, peptides,
4 nucleosides, nucleotides, ribonucleic acids, deoxyribonucleic acids.

1 13. The method according to claim 1 wherein the material to be crystallized
2 contains at least two or more materials selected from the group consisting of
3 viruses, proteins, peptides, nucleosides, nucleotides, ribonucleic acids,
4 deoxyribonucleic acids, small molecules, drugs, putative drugs, inorganic
5 compounds, metal salts, organometallic compounds and elements.

1 14. A microfluidic method according to claim 1 wherein the first and second
2 fluids have a same flow rate within the lumen.

1 15. A microfluidic method according to claim 1 wherein the first and second
2 fluids have a different flow rate within the lumen.

1 16. A microfluidic method comprising:
2 delivering first and second fluids to a lumen of a microfluidic device such
3 that the first and second fluids flow adjacent to each other within the lumen
4 without mixing except for diffusion at an interface between the first and second
5 fluids, wherein the first fluid is different than the second fluid and a composition of
6 at least one of the first and second fluids delivered to the lumen is varied so that the
7 composition of at least one of the first and second fluids within the lumen varies
8 along a length of the lumen.

1 17. A microfluidic method comprising:
2 delivering first, second and third fluids to a lumen of a microfluidic device
3 such that the first, second and third fluids flow adjacent to each other within the
4 lumen without mixing except for diffusion at an interface between the first, second
5 and third fluids, wherein the first, second and third fluids are different than each
6 other and a composition of at least one of the first, second and third fluids
7 delivered to the lumen is varied so that the composition of at least one of the first,
8 second, and third fluids within the lumen varies along a length of the lumen.

1 18. A microfluidic method according to claim 17 wherein the composition of at
2 least one of the first, second and third fluids varies over time as it is delivered to
3 the lumen so that the fluid forms a gradient with regard to a concentration of at
4 least one component of the fluid that changes along a length of the lumen.

1 19. A microfluidic method according to claim 17 wherein the microfluidic
2 device comprises a plurality of lumens, the method comprising delivering first,
3 second and third fluids to each of the plurality of lumens.

1 20. A microfluidic method according to claim 17 wherein the same first,
2 second and third fluids are delivered to each of the plurality of lumens.

1 21. A microfluidic method according to claim 17 wherein different first,
2 second, and third fluids are delivered to the different lumens of the plurality of
3 lumens.

1 22. A microfluidic method according to claim 17 wherein the lumen has a cross
2 sectional diameter of less than 2.5 mm.

1 23. A microfluidic method according to claim 17 wherein the lumen has a cross
2 sectional diameter of less than 1 mm.

1 24. A microfluidic method according to claim 17 wherein the lumen has a cross
2 sectional diameter of less than 500 microns.

- 1 25. A microfluidic method according to claim 17 wherein at least one of the
2 first, second and third fluids have a different flow rate than another of the fluids
3 within the lumen.
- 1 26. A microfluidic method according to claim 17 wherein at least one of the
2 first, second and third fluids have a same flow rate than another of the fluids within
3 the lumen.
- 1 27. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions.
- 1 28. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions, the second fluid
3 comprising the material to be crystallized and being positioned between the first
4 and third fluids.
- 1 29. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 molecule.
- 1 30. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 protein.
- 1 31. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 macromolecule with a molecular weight of at least 500 Daltons.
- 1 32. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 member selected from the group consisting of viruses, proteins, peptides,
4 nucleosides, nucleotides, ribonucleic acids, deoxyribonucleic acids.
- 1 33. The method according to claim 17 wherein the material to be crystallized
2 contains at least two or more materials selected from the group consisting of
3 viruses, proteins, peptides, nucleosides, nucleotides, ribonucleic acids,

- 4 deoxyribonucleic acids, small molecules, drugs, putative drugs, inorganic
- 5 compounds, metal salts, organometallic compounds and elements.